GENERATION 01'111(;11 RESOLUTION TOPOGRAPHIC MAPS OF '1'1 IE GALAPAGOS 1S1 ANDS USING TOPSAR DATA

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in the summer of 1993 the JPL/NASA TOPSAR airborne interferometric radar collected data covering the islands of Isla Isabela and Isla Fernandina in the Galapagos chain. These islands have a combined surface area of 5230 km^2 and have. elevations ranging from sea level to over 1700 m. A total of fifteen TOPSAR passes were collected with 12 km wide swaths in the cross track direction and in strips ranging from 30 to 100 km in length in t he along track direction. Processing of the data is limited to strips of 40 km in length due to disk space limitations. This necessitates mosaicing data in the along track as well as the cross track direction. Mosaicing of data in the along track was made trival by selecting a common reference track for all strips that required multiple processing runs and designing the processor to produce identical results in a specified overlap region between contiguous along track strips. Cress track mosaicing of the data by dead reckoning is not possible because the aircraft and TOPSAR navigation systems are not sufficiently accurate to produce 1 DEM's of the required accuracy for Ibis approach. '1'0 align the data vertically tiepoints taken along the coastline were used to remove an cross track slope, along track slope, and height offset. An affine transformation was least-square fitted to tiepoints in the overlap region of each of the strips . The transformation included an arbitrary three dimensional rotation, scaling in the along and cress directions, skew, and a translation. Data for one strip was then combined with data from an adjacent strip using this transformation. To avoid amplitude and height discontinuities in the final DEM a feathering algorithm was employed for data in the overlap region bet ween the strips.

This research described in this paper was carried out at the Jet Propulsion Laboratory, California Institute Technology, under contract with the National Aeronautics and Space Administrate ion.